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ABSTRACT

Schools are realizing that carefully collected and analyzed data represent the key to educational improvement. This digest outlines the most useful types of data to drive the school-improvement process, steps that must be taken to collect and analyze data, the role of administrators in guiding the data-driven reform process, and results that can be expected. Data provide an accurate way to identify problem areas in school programs, reveal strengths and weaknesses in students' knowledge and skills, and provide meaningful guidance on how teaching practices can and should be altered. The most useful types of data include student assessment data, student demographic data, perceptions data, and school program data. Through data-driven inquiry, school staff can identify areas in need of improvement, select high-priority problems for correction, and outline improvement strategies. After plans of action have been implemented and completed, school staff can continue data collection and analysis to determine whether to modify or discontinue corrective actions. Principals and other administrators can best support data-driven reform processes by providing vision and leadership. Results can include a higher level of student achievement and the school assuming a more professional and civil culture of inquiry. (Contains 11 references.) (RT)

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Data Inquiry and Analysis for Educational Reform

By Howard H. Wade

Citizens and policymakers alike, as part of the new accountability, expect schools to justify the value and effectiveness of their programs. School boards, in turn, routinely ask to see the data administrators use to guide decision-making in schools. Boards are mindful, too, that allocation of state and federal funds often necessitates documented evidence that school programs lead to verifiable improvements in student achievement (Holcomb 1999).

Apart from public relations and accountability issues, educators have come to recognize that they can no longer rely on "intuition, tradition or convenience" in making decisions about the best strategies to improve student learning (NCREL 2000). For all these reasons, more schools across the country are settling on the idea that carefully collected and analyzed data represent the key to improvement in education.

This Digest outlines the most useful types of data to drive the process of school improvement, the steps that must be taken to collect and analyze the data, the role of administrators in guiding the data-driven reform process, and the results that can be expected.

What Are the Educational Uses of Data?

Statistical data on school programs and student performance provide educators with their only real evidence of the success or failure of educational programs. Data "identify the link between teaching practices and student performance so that high achievement levels can be obtained" (Miller 2000).

When systematically collected and analyzed, data provide an accurate way of identifying problem areas in school programs. Data reveal strengths and weaknesses in students' knowledge and skills, and they provide meaningful guidance on how teaching practices can and should be altered. When acknowledged and accepted by a faculty, data can lead to the formulation and implementation of corrective courses of action that can solve problems and meet a school's goals. Once improvement strategies are under way, educators can continue to analyze the data to monitor and refine their efforts.

From a wider perspective, data can "provide an honest portrayal of the district's and school's climate" (NCREL). Data can give a clear profile of a district and the schools within it: Who are our students, teachers, and families? What trends, attitudes, abilities, and values do they exhibit? What outside factors influence them?

What Types of Data Are Most Useful?

The profile of a school or an educational program can include at least four types of data:

- *Student assessment data* include measurements of student performance, such as standardized test results, grade point averages, and standard and other formal assessments, both state and federal.
- *Student demographic data* describe such things as enrollment, attendance, grade level, ethnicity, gender, family background, and language proficiency. They may include facts on student mobility, modes of transportation, parent involvement, student behavior, and social problems.
- *Perceptions data* document how a district or school is perceived not only by its students, teachers, and parents, but by the community at large. While this type of data is the most subjective—collected by questionnaires, surveys, interviews, and observations—it can often prove crucial in determining the direction a school may take in its programs and learning strategies.
- *School program data* define programs, instructional strategies, and classroom practices. This type of data is most useful in monitoring, refining, structuring, and redirecting school programs. In collecting these data, "educators must systematically examine their practice and student achievement, making sure both are aligned with specifically defined, desired student outcomes" (Bernhardt 2000).

How Can a School Begin Using Data?

The process of using data to improve school programs must be supported not just by one or two administrators, but by as many faculty members as possible. Data inquiry must grow out of a common recognition of the potential benefits statistical data can have in helping to achieve common goals.

Data analysis can be used at various levels within a school. Individual teachers can use it to improve teaching strategies in their classrooms. Groups of faculty can use data analysis to amend areas of concern within a department. Finally, the entire school can use data analysis to reform and improve the educational climate.

Although variations exist, depending on personnel and circumstances, educational reform through data analysis involves four steps.

First, the school staff identifies areas of concern for which improvement is desired. By gathering and analyzing existing assessment, demographic, perceptual, and program data, staff members create a profile of the school. This profile will reveal a school's strengths and weaknesses, and will allow interested faculty members, administrators, parents, and community members to ask appropriate questions regarding student achievement, teaching practices and programs, and school culture. Data collected during profiling can sometimes be used as baseline information against which subsequent improvement strategies can be measured.

Second, after the school profile is complete, interested teachers, administrators, and community participants meet together as a leadership team to prioritize the areas of concern that the profile has revealed. This is best achieved before the school year begins, and before faculty become immersed in the day-to-day challenges of teaching.

Third, once a problem is selected for correction, the leadership team collects and analyzes any additional data that might elucidate and suggest solutions to the problem. The team then outlines strategies for improvement and defines evaluation criteria against which the courses of corrective action will be measured.

Finally, after plans of action have been implemented and completed, the team again collects data to measure the success or failure of their efforts. The corrective strategies may be discontinued or adjusted and reapplied as needed.

Schools without experience implementing data-analysis methods should start with simple problems, then advance to more complex issues only as benefits are witnessed and confidence gained. As well, it is important that the faculty commit to implementing the leadership team's recommendations, because without such commitment efforts for reform might end before benefits are realized.

For many schools, the appointment of a school-based facilitator or "data analyst" may be desirable. The analyst advises the leadership team in its collection and analysis of data, and in implementing corrective projects. In particular, the analyst helps "schools focus on their own particular problems, set locally appropriate goals, identify a course of action, and assess progress toward these goals" (Killion and Bellamy 2000).

Selected from the faculty to encourage trust and confidence among staff for the process, the data analyst must be trained in data analysis, interpretation, and display processes. Because analysts are on-site, they can provide teachers and principals with timely responses and assistance (Killion and Bellamy).

How Can Administrators Overcome Barriers and Help Their Schools Use Data Effectively?

Despite the arguable benefits of data analysis, some educators remain ambivalent about its usefulness. No doubt a few educators cling to the antiquated notion that data collection is unprofessional. It certainly is true that, as Bernhardt notes, many educators "lack the training, equipment, and time to develop and carry out complex analyses." Last but not least, a fear often exists that data, if publicized, might somehow expose incriminating inadequacies and/or incompetence.

Principals and other administrators can best support data-driven reform processes by providing vision and leadership. Although they need not be proficient themselves in sophisticated data-gathering and data-analysis techniques, they should be acquainted with the field, and should respect and value data analysis as an increasingly important tool in education.

Administrators do not necessarily need to direct the data-collection and data-analysis process, but they must support it. They must be able to assure the more skeptical participants that it is being undertaken not to blame or accuse, but to give both teachers and students the necessary tools to succeed.

Because administrators often possess a broader view of the issues that confront a school or district, they can help select the best, most easily measurable, results-oriented goals and initiatives. They can ask questions about student achievement and teaching practice, and can propose menus of initiatives based on the acquired data. Finally, they can guide staff development based on which initiatives have worked and which have not, according to analysis of the data.

What Results Can Be Expected from Data Inquiry and Analysis?

Clearly, data analysis is not a panacea that will solve every problem in a school. But when properly focused and implemented, data analysis is one tool that a school's staff can use to help raise educational achievement, thereby increasing confidence among faculty, students, and the community regarding the effectiveness of public education.

In learning to incorporate data analysis as a regular part of their professional activity, teachers become more reflective about their teaching practices, less reactive, less willing to accept easy answers, and more open-minded to solutions based on the data they gather. As a whole, the school assumes a more professional and civil culture of inquiry, in which "teachers share with each other important questions and ideas related to teaching and learning" (Feldman and Tung 2001).

Through program improvements brought about by data analysis, a higher level of achievement can also be expected of students. In some cases, students have even begun emulating the practices of data inquiry they see their teachers modeling, conducting their own student surveys and analyses (Feldman and Tung).

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